IND'S GREAT GEOLOGICAL BY GEORGE PREDERICK WRIGHT

represent or Joseph D. BOMES

HOSE who live in the wellwatered portions of the world, where rich vegetation covers the surface and protects it from the denuding force of the wind, can have little reallsing sense of the effectiveness of this over-active geological agency. Yet

some well-watered regions dunes are familiar phenomena. Dunes are simply "drifts" of sand, closely resembling the snowdrifts of winter and protection against them is secured by similar means. As in snowy regions one sees long lines of close board fences some distance from the windward side of the railroad to stop the drifting snow on its onward career, so he may in many places see windbreaks to stop the drifting sand. But in many cases where the windbreak is not sufficient a constant force of workmen is necessary to remove the sand from the track at stated intervals or after every unusually severe storm. At such places the railroad companies, to their sorrow, learn the enormous power of this constantly acting geological force in transferring comminuted earthy material from one place to another.

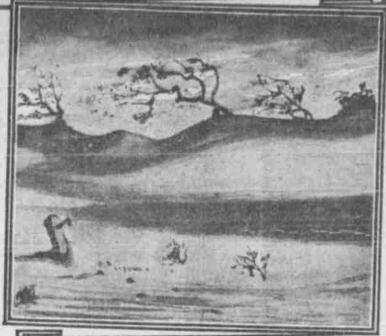
One of the best known rocalities for observing dunes is found on the southeastern shore of Lake Michigan. Nearly all, if not all, the railroads approaching Chicago from the east pass through this series of dunes as they come around the southern end of the Many of the dunes are very fresh, with no covering of vegetation, and rise, like snowdrifts, 50 feet or more above the general level. Others favorite centers for ranchmen are of such age that they have been covered more or less with vegetation, trees of considerable size being found upon them. But in all cases the action of the wind, in moving the sand southward from the lake, is evident. The wind blowing from the north keeps an exposure of bare sand upon this belt of dunes is composed is probthat side and drifts it over into exposures of equally bare sand upon the outer margin. The width of this belt of dunes around the south end of Lake Michigan averages a little more than tains and deposited along the banks, one mile. The material, being cleanvery few houses, and those mostly belonging to railway employees.

The source of the material of which these duncs are composed and the rate of its movement are subjects of great interest. The sand is derived, in the first place, from the shores of the lake farther north, which are constantly being esten into by the waves and currents. All along the western above, from Evanston to Racine, the waves are wearing away the shore at an average rate of material that falls into the lake from bloffs thus eroded is worked by the waves until the very finest particles are washed out and floated into deep water, while the sand remains near the shore and is gradually washed southward by the prevailing currents. Everyone in Chicago knows how land is forming on the shore, giving rise to legal contests as to ownerable. From observations of the United States engineers it was found that 129,000 cubic yards of sand were annually stopped by the two piers which were extended out into the lake to deep water. This vast amount represented, bowever, but a fraction of the whole amount of sand that was being carried by the currents past Chicago to the south end of the lake.

On reaching the south end of the lake the sand is washed up by the waves during storms and left for a considerable portion of the year exposed to the action of the winds, which have drifted it out into the belt of dunes, with which so large a portion of the traveling public is familidunes is found upon the east shore, maidens before their marriage. Michigan. Travelers upon the quarter of a mile wide, rising someextends northward all along the shore, traction those of living actors, being specially prominent at St. Jo- in Covington, Ky., is the largest places they threaten to overwhelm forests have been completely buried out of eight.

It has been profitable to dwell thus fully upon the dunes around the made in Engiand; but the very finest southeastern portion of Lake Michicome from France and Germany, and gan, not because they are the largest they are made with a degree of peror the most conspicuous in the world. rection most surprising. Even cheap them except to become teachers, two but because they are the most access dolls can close their eyes and say will be professional farmers, nine will sible and the best known to the "papa" and "mamma." For a little do religious and charitable work, six people of the United States. In some more money you can buy a creeping will adopt literary careers and three respects a still more interesting belt doll or a walking doll. Then there of dunes occurs in western Nebraska, are dolls that sing—only the music, up domestic science. It is said that stretching nearly across the northern of course—and the very latest doll is but few of the 56 expecting to teach part of the state, approximately par- provided with a phonograph, and will really care for this kind of work. Sevallel with the course of the North recite prese and poetry. Platte river, but at a distance of many

Red and are covered with such mov ing drifts, but most attention has been attracted to them in the more thickly settled portions of Europe, where they sand hills 50 or 60 feet in height, where in more than one instance whole villages and ancient churches have been buried by the material. In Eccles the viliage church in 1829 was almost completely hid by the drifting and which enveloped it, while 30 years later the same wind which



DAND CHINED BOUTH OF LAKE MICHIGAN

vard scross the state. The prevailand drifting it over onto the north- town), near Thetford, was slow is the movement that vegetation spread over 1,000 acres of land. covers their slopes and water is pre-

traveling embankment moving so majestically across the western plains of Nebraska and the manner of its movement are even more interesting interior. As fast as one ridge is than the similar phenomena around Lake Michigan. The sand of which ably derived from the trough of the stantly on the move from the sea mar-Platte river, where during the great gin toward the interior floods of a former period it had been brought down from the Rocky mounone mile. The material, being clean- whence it was lifted by the winds and land they sometimes rise to a height washed cand, is unfit for agricultural started upon its victorious career over of 260 feet, but average only from 50 purposes and the area is occupied by the uplands of the interior. The whole guitivated their gardens upon the miles wide.

jestic in the extreme

miles from it. This consists of a belt had buried the church uncovered it of sand hills a half-mile or so in and exposed it to view upon the other width, which is slowly traveling east- side of the dune. The churches of St. Piran and Gwithian in Cornwall ing southwest winds are constantly passed through similar experiences, blowing the material from that side while in 1668 a part of Santon (Sandeastern side, thus gradually shifting wholmed by sand which had been the line of the belt. So irregular are slowly blown in from five miles to the the crifts, however, that innumerable west. In the course of a century this ho so a are left between them, and so dune had traveled four miles and

The northwestern coast of France served in them; hence they furnish is specially exposed to the destructive movement of dunes. On the coast of The source of the material of this Gascony "the sea for 100 miles is so barred by sand dunes that in all that distance only two outlets exist for the discharge of the drainage of the driven away from a beach another forms in its place, so that a series of huge sandy billows, as it were, is con-

The entire coast of Flanders and of Holland and northern Germany is girt with these drifting sand bills. In Holto 60 feet. Dunes of smaller extent movement is exceedingly slow, but it also line the western shore of Ireland is easily perceptible, especially to and Scotland, but on the Dutch coast those who have built their houses and they are sometimes as much as five eastern side. But when one considers of the Bay of Biscay, where vegetathe vast amount of material that is tion has not had time to protect them. being transported by the wind along they are traveling inward at the rate this entire boit the movement is ma- of 16 feet per annum, while in Denmark they are in some places moving The arid lands of Utah and Arizona as fast as 24 feet per annum. The and other portions of the great west only method of protection against afford innumerable Blustrations of the them, which, happily, is partially sucactivity of wind in drifting sand into cessful, is to plant pine forests, which three or four feet per annum. The regions distant from its original readily grow in the sand and through

source of supply. The desert of Saha- the production of turpentine become ra. Arabia and the region about the the source of considerable revenue.

Where Our Dolls Are Made

Some Factories in America, But About facture of toys and dolls, and the \$2,000,000 is Contributed Yearly to Foreign Makers.

Dolls have amused the world for ages, and seem to have been well known in the days of the Pharaohs, for, in the tembs of ancient Egypt, figures of painted wood, of terra cutta, of ivery and of rags hive been found whose limbs were made movable for the delight of children.

In the rules of Eltruria similar toys have been discovered, and in China, as well as in India, movable figures were made to act from time limmemorial by hand and on strings, or as shadows behind a curtain.

The ancient Greeks were experts in the manufacture of puppets, in-But, owing to the fact that the cluding wax dolls, and several of prevailing winds of this region are their posts allude to offerings of dolla westerly, the largest accumulation of to Artemis and Aphrodite, made by

Dolls were evidently first intended Michigan Central railroad cannot fall to amuse children, but the adults them. Make out your pedigree, trato have noticed these great drifts of soon adopted them as a source of ensand, nearly 100 feet high, at Michi- tertainment. Puppet shows were all gan City. This belt of dunes, about the rage in Europe in the sixteenth century, arriving at such perfection times to more than 100 feet in height, that the performances rivated in at-

seph and Grand Haven. In many doll factory in the United States, and it. Two men may seem the same, yet there are many other establishments one man may hand down disease and whole villages and to compel the rail- in the eastern states. But the most crime to his descendants, while the roads to remove their tracks to get dolls, and we are sorry to have to other may hand down only those qualout of the way of the drifting mate- say it, the best dolls, are imported, ities that are good." rial, while in some cases houses and and the American children contribute about \$2,000,000 every year to Europe for dolls.

There are some very fine dolls class of Wellcaley college are 288 in come from France and Germany, and

Germany is famous for the manu- stay at home.

small town of Sonneberg, in the Thuringian forest, alone produces articles for the amusement of children to the value of \$150,000 yearly.

German ladies are expert doll dressers, and there is a yearly Christmas exhibition of dolls at Berlin. great deal is made of the Berlin doll exhibition, and society turns out in large numbers to patronize it.

There are whole towns in Germany that do little else but make dolls for American children. They are mostly simple country tolk. They get small pay for making even an excellent doll, but it must be remembered that their wants are few,

Family Study Valuable.

Speaking to the students in an Engiish women's college, an educator 'Dig out all your family skelmid: ctons. Your relatives will probably be annoyed, but dig them out and face cing your family back to your greatgrandfathers and their brothers and sisters. By this means you can learn what traits to avoid and what discases to guard against. It takes time, tact and temper to hunt back to the record of one's family, but it is worth

What They Will Do. The members of the graduating number and of these only eight will admit that they plan to marry when school days are over. Highty-six of will travel, only one expecting to take enty-three of the class will simply Follow this advice.

Quaker Onts is the best of all foods it is also the cheapest. When such settled portions of Europe, where they men as Prof. Fisher of Yale University and Sir James Crichton Browns, mense amount of trouble. The coast of Norfolk, in England is fringed with best parts of their lives in studying the great question of the nourishing and strengthening qualities of differen foods, it is certain that their advice is

absolutely safe to follow.

Professor Fisher found in his ex periments for testing the strength and endurance of athletes that the meat eaters were exhausted long before the men who were fed on such food as Qualter Outs. The powers of erdur ance of the non-ment eaters were about eight times those of the mean

Sir James Crichton Browne says ent more catment, out plenty of it and eat it frequently.

Packed in regular size packages, and hermetically sealed ting for hot cli-

Spreading the News. Postmaster Fuller of Rockland, Me. was the sparkling wit at the postmas-

tern' dinner. He announced with mock solemnity that he had just received word from his congressmen that his name had been sent in somewhere in Washington for reappointment in recognition of his efficient service and the rotes he could swing.

"I have dashed the momentous news of my triumph to distant Rockland to my wife, and if I am acquainted with the lady, as I believe that I am, the glad tidings have ere now penetrated to the most remote section of that district," was a sally that brought

\$100 Reward, \$100.

\$100 KCWHIG, \$100.

The renders of this paper will be pleased to learn at there is at hear one dereaded chases that seems been also to ture in all its stages and that it shall be the company of the composition of the company of the company attention of the section fracturing a reconstitutional disease. Requires a stantificant treatment. Hally Chinris Cure is taken in early acting directly upon the blood and macross have of the system, thereby desired in the system, thereby desired the macross of the system, thereby desired the patient marks by building up the eccentration and another marks by building up the eccentration and another than the stanting of the disease, were. The properiodre laws much table in the carative powers that they offer a Rundrag Dutane for any case that it lain to be feed may but of testimentals.

After a CHENERS & CO. Timbo. O.

The Hall's Amonly Plus to compute the.

Take Hall's ramby Pole for opostipation.

Her Excuse.

"Why-er-yes," Miss Goodley admitted, "perhaps you did bear me tellng the minister I was only twenty-

"Oh, I'm surprised!" excinimed Miss Geddiet, "and you a Sabbath school teacher, too!"

"But," Miss Goodley protested, "the minister has told us it's always better to understate a thing than to exag-

A Sample Box of Resinol Ointment Was Nearly Sufficient in

This Case. Enclosed find money to pay for Resnot. Just the sample you sent has almost cured Ecrema on my little girl's face. I will gladly tell my triands of the great merits of Resinol. Mrs. Emma B. McConkey, Hacker Valley, W. Va.

Not Exactly What She Meant. She-We've bin very busy at the others' meetle' gettin' ready for the sale of work

He-Oh! I 'opes it will be a success. She-Yes, I think so; yer see the vicar is goin' to take most of our clothes off of us .- Tatler.

Important to Mothers CASTORIA, a safe and sure remody for infants and children, and see that it

Bears the Signature of Cat H. Flicher. 2500 The Kind You Have Always Bought.

Strictly Accurate Lawyer-So you say the defendant pushed you against your will? Witness-No, sir: I said he pushed me against the door.

Red, Weak, Weary, Waters Eyea. Relieved By Murine Eye Remedy. Try Murine For Your Eye Troubles. You Will Like Murine. It Scothes. Se at Yout Druggists. Write For Eye Rooks. Free, Murine Eye Ramedy Co., Chicago.

Brutet

"If I died, would you pine away?" "No. I'd spruce up!"-Cleveland Leader.

A precious thing is all the more precious to us if it has been won by work or economy.-Ruskin.

TELLOW CLOTHES ARE UNSIGHTLY. Keep them white with Bed Cross Ball Blue, All grocers sell large 2 on, puckage, 5 centa. The man who bets on the wrong

horse is apt to have a ruce prejudice PRINCIPAL SEVENTY VEARS
PRINCIPAL SEVENTY VEARS
RADO PRINCIPAL SEVENTY AND ASS. be resembly for distribut, dysentery and all be pushes. Get the genuine. He, He and Mc.

The success of a scheme depends largely upon the man behind it.

Mrs. Wheshow a Southling Syrup, distret torolog, as here the ginite, reduces to attenuating a polit years wind male. Est a bound

A smile that won't come off seen be-

Of the pain which many women experience with every month it makes the gentlemens and kindness always associated with womanhood seem to be almost a miradis. While in general no woman rebels against what she re-gards as a natural necessity there is no woman who would not gladly be tree from this recurring period of pain. Dr. Pierce's Favorite Prescription makes

When You Think

week women strong and sick women well, and gives them freedom from pain. It establishes regularity, subdues inflamstion, heals alceration and cures temale weakness,

Sick women are invited to consult Dr. Pierce by letter, free. All correspondence strictly private and saccelly confidential. Write without fear and without fee to World's Dispensary Medical Association, R. V. Pierce, M. D., President, Buffalo, N. Y.

If you want a book that tells all about woman's diseases, and how them at home, send 21 one-cent stamps to Dr. Pierce to pay cost of culing early, and he will send you a free copy of his great thousand-page illustrated Common Sense Medical Advisor—revised, up-to-date edition, in paper covers, in handsome cloth-bioding, 31 stamps.

THEY KNEW,



analous to show his knowledge. Jagson-Waen he gets older he's fust as anxious to conceal his ignor-

LEWIS' "SINGLE BINDER."

A hand-made cigar fresh from the table, wrapped in foil, thus keeping fresh until smoked. A fresh claur made of good tobacco is the ideal smoke. The old, well cured tobaccos used are so rich in quality that many who formerly smoked 19c cigara now smoke Lewis' Single Binder Straight Sc. Lewis' Single Binder costs the dealer some more than other 5c cigars, but the higher price enables this factory to use extra quality tobacco There are many imitations; don't be fooled. There is no substitute! Tell the dealer you want a Lewis "Single Binder."

An Unusual Attribute

Little Johnnie, who cannot pro nounce S, has been frightened into keeping out of the attic by tales told by his nurse of a dreadful ghost that ives in the dim recesses under the caves. The other day he was over heard to say confidentially to a small friend:

"We've got an old gho't up in our attic!" To which his friend, much later-

ested, responded: "Do he butt?" Desire for Information.

"Mrs. Gaddington wants to know all shout everybody's business." "Yes," replied Miss Cayenne. "She

regards matrimony as a failure be cause she didn't marry a census

FIGHTERS IN THE MAJORITY Veteran Member of Congregation Was Tired of Part He Had Been

Playing.

Representative Harry Maynaed of Virginia tells the story of how a religious old negro in his district put a stop to the exercise of Christian charity in the congregation of which he was a member. It seems that it was a practice in the church to excess municate for one year any member who had been guilty of a "blood fight" -that is, any man who had attacked another with a plated or a rusor.

At the end of the year, if the effender withou reinstatement, he could go to the "mourners' beach," rise and declare his repentance, and be forgiven by the congregation. This went on for many years. At last a young darky who had been to a particularly abjectionable broil appeared for reinstatement. The poster made an elequent appeal to the congregation and everybody began to shout and uny

It was at this point that the old

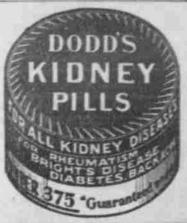
segro arose and said botly; "Look hysh; paheon; eber since I been a membuh of die congergankun, dar ain' been nothin' but fightle' an' fuhgivin'-un' i been doing all de

functivia'. Two tired of Rf" That broke up the meeting.-Popplar Magazine.

Not in the Agreement, Deniel had been cast into the Bong"

"My main objection," he said, as he playfully tweaked a lice's mane, "is that I get no moving-picture royalties."--Pack.

Many a man falls to make good because he spends most of his time trying to prove that lock is against him.



DEFIANCE Gold Water Starch



STOCKERS & FEEDERS nice quality; reds and runn aght on orders. Time of The sits to estern from Sadivlague sands to select from Satisfaction Quaranteed. Correspondence Invi-ted. Come and see for posteril

therefore, should be

declined.





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DEFIANCE Gold Water Starch